

### **REMARKS/ARGUMENTS**

Reconsideration of this application and entry of this Amendment are solicited. Entry of this Amendment at the very least is appropriate as it responds to and accepts suggestions made by the examiner in concerning the wording of claim 1 as stated on page 7, item 6 of the current Official Action.

The Official Action repeats a provisional obviousness-type double patenting rejection and, as before, applicants will hold in abeyance a full response to this rejection until such time as claims are allowed in the subject application or in the referenced application.

This leaves for consideration the rejection of all pending claims as stated in item 7 of the Official Action.

The claims are held to be obvious in view of Hughes et al. and Schrooyen et al. Applicants disagree with the examiner's conclusions for at least the following reasons.

In accordance with the present invention as defined in applicants' claims, keratine is degraded oxidatively during which SH bridges are oxidized to sulphone groups that provide the polymer with a negative charge. As a result, the protein hydrolysate dissolves much better in water. This allows the use of relatively high concentrations of the protein hydrolysate in a papermaking process.

As shown in the Examples of the present application, a high concentration of the protein hydrolysate in a papermaking process yields a paper with advantageous physical properties, such as decreased porosity, better short compression and fiber interaction, increased tensile index, and increased stretch at break. These specific improvements are not disclosed or suggested in the cited prior art, and therefore the present invention is not obvious.

In more detail, Schrooyen et al describe products that are derived from naturally occurring sources of keratin and keratin fibers. The application of keratin-based products as a component in films and coatings is mentioned by Schrooyen et al on page 4, lines 4-7.

As pointed out by the Examiner, Schrooyen et al teach that complete modification of keratin is a negative. Therefore, in the process taught by Schrooyen et al the keratin is only partially modified.

The partial modification described by Schrooyen et al can be an oxidation using peroxides, such as hydrogen peroxide or organic peroxides, including but not limited to

performic acid or peracetic acid to form sulphonate groups (Schrooyen et al, page 9, lines 5-6). This partial oxidation provides the keratin material with *negatively* charged groups (Schrooyen et al, page 9, lines 3 and 12-13).

Hence, Schrooyen et al describe a partial oxidation of keratin material, which yields a modified keratin material with a negative charge.

Hughes et al describe a method for making a collagen strengthened cellulosic sheet, wherein collagen is added to cellulosic pulp slurry and the mixture is formed into a sheet, which is dried (Hughes et al, column 4, lines 56-63). There is no teaching whatsoever in the Hughes et al patent which suggests or indicates that a negatively charged material could be used in the papermaking process. Rather, Hughes et al teach away from using a negatively charged material by teaching to use collagen, which is neutral.

The skilled person seeking the improvements mentioned above would not be motivated to combine the teachings of Schrooyen et al and Hughes et al, because Hughes et al teaches to use *neutral* collagen, instead of a negatively charged material, such as the partly oxidized keratin of Schrooyen et al.

In addition, it is noted that the important chemical difference between collagen on the one hand (which does not contain sulphur atoms) and keratin on the other hand (which contains numerous sulphur atoms) would keep the skilled person from replacing one with the other. In other words, the collective information provided by these two references teaches away<sup>1</sup> from the present invention.

In any case, the skilled person would not have any expectation of success that replacement of the collagen material in the specific method described by Hughes et al with the partially oxidized keratin material of Schrooyen et al would still yield satisfactory paper sheets, let alone that this replacement would lead to any of the improvements as shown in the Examples of the present application.

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<sup>1</sup> An important consideration in determining obviousness is "teaching away" from the claimed invention by the prior art. *In re Dow Chemical Co.*, 837 F.2d 469, 473 (Fed. Cir. 1988). A reference teaches away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant. A reference will teach away if it suggests that the line of development flowing from the reference's disclosure is unlikely to be productive of the result sought by the applicant. *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994); *see also KSR Int'l Co. v Teleflex Inc.*, 127 S. Ct. at 1739-40 (explaining that when the prior art teaches away from a combination, that combination is more likely to be nonobvious).

SLAGHEK ET AL.

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In view of the above, it can only be concluded that the invention is not obvious in view of Schrooyen et al and Hughes et al.

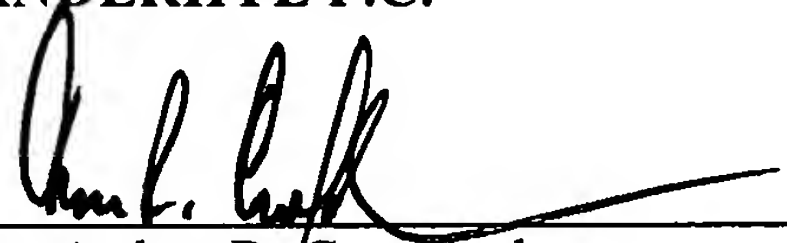
In case you have any questions or require additional information, please do not hesitate to contact me.

For the above reasons it is respectfully submitted that claims 1-14 are free of the prior art and counsel will address the provisional obviousness-type double patenting rejection upon the examiner's indication of allowable subject matter. Should the examiner require further information, please contact the undersigned.

Respectfully submitted,

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